FIELD NOTES

1. Kerr-McGee Corporation
   Kerr-McGee Building
   Oklahoma City, Oklahoma 73102

   Place of Use: Sequoyah Facility

2. License No. SUB-1010, Docket 40-8027, Category I, Priority II

3. September 20, 21, 22, 1971 - announced, reinspection

4. Persons accompanying inspector: None

5. Persons contacted:

   Burnell Brown, Facility Manager
   J. W. Craig, Manager - Conversion Engineering
   C. A. Groselaude, Manager - Health Physics, Industrial Safety
   Allen Valentine, Coordinator, Radiation Health and Safety
   G. E. Wuller, Licensing and Regulation Officer
   Other individuals as identified.

6. At the time of this inspection, the Sequoyah facility was not in normal operation. On September 1, 1971, the conversion process had been stopped in order that the facility could undergo a major maintenance repair and cleanup operation. The facility manager estimated that the conversion operation would be restarted about October 1, 1971. The manager advised that, for approximately the next 15 months, it was anticipated that the facility would operate at approximately one-half capacity. No items of noncompliance were identified during this inspection. Form AEC-591 indicating no items of noncompliance was mailed to the licensee following the completion of the inspection.

7. Previous inspection: October 21, 22, 23, 1970

8. No proprietary info.

Initials	Inspector	Date
JEH	James E. Hyder	12-2-71
GDB	Glen D. Brown	12/3/71
Initials	Reviewer	Date

Inspection History

9. The activities authorized under License No. SUB-1010 were last inspected on October 21, 22, 23, 1970. As a result of that inspection. the licensee was advised by letter dated January 11, 1971, of two items of noncompliance:

   1. Contrary to 10 CFR 20.201(b), "Survey, " no surveys were made to evaluate the quantities of radioactive material contained in the hydrofluoric acid which had been recovered from the hydrofluorination beds prior to releasing the acid to commercial firms during the period July 24, 1970 to October 19, 1970.
   2. Contrary to License Condition No. 8, which incorporates the representations, specifications, and procedures contained in Appendix A of the September 23, 1969 application, diffusing calculations were not performed as specified on page A-11 of the appendix to determine the areas of maximum ground level concentrations for quarterly air samples at upwind and downwind locations from the plant could be taken. It was found that no such calculations have been made since the plant started operation in early 1970.

10. Each tank truck of hydrofluoric acid is sampled and assayed for uranium content prior to release of the truck. Natural uranium in concentrations between 1×10^{-6} uCi/ml to 5×10^{-6} uCi/ml of acid have been measured.

11. The calculations for estimating the points of maximum downwind ground level concentrations have been made, a copy of the licensee's calculations is contained in the attached memo dated February 2, 1971. In lieu of the quarterly samples at these locations, the licensee now has three continuous air monitoring stations in operation. Samples are collected and analyzed weekly.

12. In addition to the items of noncompliance, two safety items were mentioned in the January 11, 1971 letter; one of these concerned the collecting of samples, but not analysing the same at the various locations about the facility, and the inspector's

observation of visible amounts of uranium compounds on the floor and equipment in the various process areas.

13. During this inspection, it was determined that samples are collected as specified in the licensee's procedures, with these samples being analyzed on a timely basis. All samples collected during the month of July for instance had been assayed before the end of August. It should be noted that many of these samples are composite samples collected over an entire month; some samples are analyzed by the licensee's facility in Oklahoma City, other samples are analyzed by an independent contractor. All analyses were found to be timely. As noted previously, in the summary of findings, the facility was in a shut down condition for maintenance and cleanup and during this inspection, no unusual amounts of uranium compounds were observed by the inspector.

Scope and Conditions of License

14. Since the previous inspection, one amendment has been issued to License No. SUB-1010. The letter and amendment read as follows:

> Your application dated November 5, 1970, has been incorporated into the demonstration portion of your application for license No. SUB-1010. In order to provide continued continuity in the license for subsequent construction of waste disposal facilities, Condition 17 has been added to License SUB-1010 to read as follows:
>
> > 17. In the location, design, construction, maintenance, and inspection of waste disposal systems into which effluents containing radioactive material in excess of the limits specified in Column 2, Table II of Appendix B, 10 CFR Part 20, are deposited, the licensee shall follow the criteria established in Section 4, page 5, of the enclosure entitled "Information and Criteria Pertinent to Evaluation of Embankment Retention Systems." In addition, the licensee shall establish appropriately

located test holes near retention ponds to check for seepage if any of radioactive materials. All other conditions of this license shall remain the same.

15. The licensee has constructed a new raffinate pond directly west of raffinate pond No. 1. The licensee stated that it was believed that the new pond could contain approximately 12 million gallons of solution . At the time of this inspection, this pond had not been placed in use as monitoring wells to check for seepage have not been drilled. The inspector was advised that the drilling of these monitor wells was expected to commence during the first week of October, 1971. Construction per AEC Criteria?

Organization and Administration

16. The current administrative organization was explained as follows:

Mr. George Cobb, Executive Vice President for the Exploration Division and the Research Division of Kerr-McGee Corporation

Mr. Howard Eberline, Director, Physical Science and Measurement Department of the Research Division - reports directly to Mr. Cobb

Mr. A. W. Valentine, Coordinator of Radiation Health and Safety, a position he describes as being in essence the Corporate Radiation Safety Officer, reports to Mr. Eberline.

Mr. Doug Sly, Staff Health Physicist for Nuclear Division Operations, reports to Mr. Valentine

Mr. C. A. Grosclaude, Manager of Health Physics and Industrial Safety, Sequoyah facility, although employed in the Nuclear Operations Division, has certain functional reporting responsibilities to Mr. Valentine.

17. Mr. George B. Parks, Executive Vice President for Nuclear Operations Division and for Trans-World Drilling Division.

Mr. Parker Dunn, Group Vice President for Nuclear Operations.

Mr. W. J. Shelley, Director, Regulations and Control, reports to Mr. Dunn

Mr. George Wuller, Licensing and Regulation Officer, reports to Mr. Shelley.

Mr. David Folley, Manager of Project Engineering, also reports to Mr. Dunn.

Mr. Burnell Brown, Sequoyah Facility Manager, reports to Mr. Dunn.

Mr. C. A. Grosclaude, Manager of Health Physics and Industrial Safety, Sequoyah Facility, reports to Mr. Brown

As stated previously, Grosclaude also has certain functional reporting responsibilities to Mr. Valentine, Coordinator of Radiation Health and Safety.

18. Mr. Grosclaude stated the Sequoyah employment totaled approximately 100 persons. He added that the plant operates on a continuous basis, with the bulk of the employees divided into four equal rotating shifts.

19. Grosclaude stated that he estimated that his work was approximately 60% health physics related, and approximately 40% normal industrial safety/industrial hygiene type activities. Grosclaude stated that he had been engaged in health physics-type work since 1954. Grosclaude stated that he was employed at Hanford from 1954 until 1964. From 1964 until 1968, he was employed as a health physics technician at the LaCrosse Boiling Water Reactor, and from January 1968 until September 1970 had been employed at the Nevada Test Site. Since September 1970, he has been engaged in health physics activities at Kerr-McGee's Sequoyah facility.

20. Grosclaude stated that there were four health physics technicians, K. G. Simeroth, K. J. Glass, L. A. Henry, and D. C. Williams. According to Grosclaude, Simeroth, Glass and Henry were all originally employed as chemical operators at the Sequoyah facility and had had no prior health physics training; however, all have been engaged in health physics related work at Sequoyah for approximately one year. Grosclaude stated that Williams, who has been employed at Sequoyah for approximately three months, had been in the Navy's nuclear power program and

had had prior health physics training.

21. Grosclaude informed the inspector that Mr. Doug Sly, the previous manager of Health Physics and Industrial Safety at Sequoyah, had been transferred to the Kerr-McGee corporate staff, effective September 16, 1971.

Facilities and Equipment

22. Tour of the facility revealed that the facility and equipment contained therein is essentially as described in the licensee's application and as described in previous inspection reports.

23. At the time of this inspection, the plant was not in operation; rather, the facility was undergoing a rather extensive maintenance and cleanup program. During the tour it was noted that all employees had available half-face mask respirators. No visible dusting was observed, and very little surface contamination was apparent.

Radiological Safety Precautions and Procedures

24. Detailed smear surveys are conducted weekly throughout the process area and in the areas that are assumed to be clean, such as cafeterias, offices, etc. The licensee has established smearable limits of 20,000 d/m alpha/100 cm^2 in the restricted area, and a limit of 500 d/m alpha/100 cm^2 in the unrestricted areas. Grosclaude explained that following the current maintenance cleanup campaign, it was anticipated that they would, in the future, be able to establish only a few small control areas within the entire plant complex, as it was their intention to keep contamination to a minimum. Mr. Brown explained that since plant startup they have continually been replacing leaking seals and things of this nature and that he believes that all sources contributing to the expensive plant contamination noted in the previous inspection had been identified and has been repaired to an extent that surface contaminations throughout the plant area can be kept to within reasonable limits.

25. Airborne concentrations are monitored by approximately 25 fixed position sampler heads located within the process area. Grosclaude stated that it was realized that the airborne concentrations detected and measured by the fixed position sampling heads does not give a full picture of what employees are being exposed to as in certain instances the filter sampler head might be some distance from the employee who is generating the airborne activity. Thus, a number of breathing zone samples have also been collected utilizing high vol air samples. Very detailed time studies of various activities have been made by Kerr-McGee personnel. Results of these time studies have been utilized, along with measured concentrations to calculate probable personnel exposures to airborne activities. This licensee has an active bioassay program which is used to verify that personnel are not routinely being exposed to excessive concentrations.

26. By letter dated January 28, 1971, the licensee reported a possible overexposure to airborne activity. During this inspection, this situation was reviewed. Mr. Valentine stated that, in all likelihood, the individual was not exposed to excessive concentrations. He added, however, that because he had not been able to obtain a series of urine specimens from this individual, he had been unable to verify the exposure and consequently, in the absence of his verification, chose to report this incident as a possible exposure to excessive concentrations of airborne activity.

27. A review of the data resulting from analyzing the activity on the fixed position filters, indicate that airborne activity within the process areas has declined markedly since the levels noted during the previous inspection and since approximately March, 1971, most samples indicated concentrations of less than MPC.

28. In addition, licensee's health physics personnel perform routine spill surveys shift-wise. Grosclaude stated that in this case they are looking for visible signs of uranium spills, etc., and that it is anticipated that in the future these inspections of

spill surveys will be conducted at approximately two-hour intervals and that each health physics technician would write a report at the end of his shift.

29. In March, 1971, a program of hazardous work permits was initiated. A copy of this form is attached. A new procedure approved by the plant manager on September 14, 1971, "Housekeeping, cleanup, and decontamination responsibilities" No. G-012, specifies that the health physics is to approve all hazardous work permits and that health physics is to make measurements of contamination levels and assess of conditions prior to the issuance of the hazardous work permit.

30. The licensee also maintains what they call Incident Reports and these include all instances in which levels of 3 x MPC are more are detected. Review of these reports indicate that in January, 1971, 17 such reports were documented. In February, 13, March 3, and April 7. During May, 13 incident reports are documented, in June 17. July had 5 such incident reports and August, 1971, had 4. No incident reports have been made out for September, 1971. It was noted during this inspection that a number of maintenance operations were not discussed with health physics personnel prior to start of work and it appeared impossible to correlate hazardous work permits with incident reports. Mr. Grosclaude stated that in the future this would be rectified in that all such reports and permits would be numbered and would be cross-referenced.

31. Particularly during January and February, 1971, many breathing zone samples were obtained primarily to evaluate the licensee's use of respiratory equipment, but to date no effort has been made to correlate breathing zone samples with the fixed filter data.

32. Mr. Grosclaude stated that respirators are cleaned and inspected by the health physics technician after each use.

33. Mr. Valentine stated that he has performed inspections of the Sequoyah facility at approximately quarterly intervals; the last such inspection was on August 12, 1971, and the visit prior to that was May 21 and 22, 1971. Valentine acknowledged that he has not yet prepared a detailed written report from his inspection notes.

Effluents

34. Gaseous effluents are monitored by sampling each stack daily. Records include information as to concentrations, wind direction and speed, temperature, etc. The licensee has now completed the calculations to determine the location of maximum concentration in the downwind directions. In addition, there are two sampling stations located at the edge of the restricted area. These sampling stations have indicated no concentration in excess of 0.5 x MPC for unrestricted areas. In addition, there are three continuous air monitoring stations located at distances of approximately one-third-mile from the facility. Concentrations have been the order of 0.2 x MPC.

35. There have been no releases of raffinate to ponds current exist and a new pond has been built. This latter retention basin is estimated to have a capacity of approximately 12 million gallons. Some solutions that are considered to be in essence clean are released; these releases are sampled daily and are composited monthly and analyzed by Controls of Environmental Pollution of Santa Fe, New Mexico.

36. Several pieces of contaminated equipment was buried on March 15, 1971. It is estimated that the amount of uranium involved in this disposal was on the order of 3950 grams or approximately 8.7 pounds. The licensee emphasized that because of the bulk, some of this slightly contaminated equipment burial on their premises appeared to be the only suitable method of disposal.

Personnel Monitoring

37. Film badges are obtained monthly from U. S. Testing Laboratory. A review of the reports indicate less than 50 millirem gamma per month and most less than 500 millirem beta per month. A few monthly exposures on the order of 700 to 800 millirem beta have occurred, however, the maximum exposure through August 31, 1971, was 570 millirem gamma exposure to operator Spain, and another exposure of 4560 millirem beta to operator Horn. Grosclaude stated that due to previous problems with surface contamination, all badges are cleaned and monitored prior to badge exchange.

Environmental Monitoring

38. A summary of the Sequoyah environmental monitoring plan is attached; this shows sample location, frequency of collection and frequency of analysis, the number of such samples per year, and the specifications of what the analysis is to include. Some of these analysis are performed by Kerr-McGee, others are performed by a contractor, Controls for Environmental Pollution of Santa Fe, New Mexico. It was determined during this inspection that contrary to previous situations that the samples are analyzed on a timely basis.

Independent Measurements

39. Samples were split with the licensee from one of the seepage wells and from the plant effluent stream. Because the plant was not in operation, the inspector ~~was~~ did not ~~able to~~ obtain air samples. since they would not be representative of plant operating conditions

Management Interview

40. On the afternoon of September 22, 1971, the inspector met with the following individuals: Burnell Brown, Facility Manager; Carlos Blount, Manager of Maintenance and Construction; Allan Valentine , Coordinator, Radiation Health and Safety; Joe Davenport, Production Manager; David Swaney, Lab Manager; C. A. Grosclaude, Health Physics Industrial Safety; and, George E. Wuller, Licensing & Regulation Officer.

During this management interview, the inspector advised Kerr-McGee personnel that due to the fact that the plant was no in operation and certain operations had not been observed and samples had not been collected, it was the inspector's feeling that this visit should be considered only a partial inspection and that in the near future an additional visit would be made during normal operations in order that the inspector could complete his evaluation of The licensee's program. During this meeting, licensee personnel were advised that items of noncompliance noted during previous inspections appeared to be adequately corrected and that no serious or significant deficiencies had been identified during this visit.

After the inspector returned to the Denver Office, it was decided that although every aspect of the program had not been reviewed this would be considered a complete inspection. Consequently, Form AEC-591 indicating no items of noncompliance was mailed to the attention of Mr. Allen Valentine, Coordinator of Radiation Health and Safety.

KERR-McGEE CORPORATION

INTERNAL CORRESPONDENCE

TO Doug Sly

DATE February 2, 1971

FROM Al Valentine

SUBJECT Procedure for Estimating Points of Maximum Downwind Ground Level Concentration

Scope

This procedure provides a method for estimating the downwind location at which the maximum ground level concentration will occur for different weather conditions and release heights. This can be applied to routine or accidental releases of chemical pollutants as well as radioactive or uranium pollutants. To apply this method, the weather condition or "stability category" and the height of release (stack height) must be determined. These data give reference points on Figure 3-9 included as attachment #2 in this procedure and enable one to determine the distance of maximum downwind concentration.

The method is based on information contained in the U. S. Public Health Service Publication No. 999-AP-26 entitled "Workbook of Atmospheric Dispersion Estimates".

Procedure

1. Determine windspeed in meters/second. Use windspeed data from weather monitoring station or best estimate.
2. Determine existing "stability category" from Key To Stability Categories, Table 3-1 in attachment #1. The stability category will be either A,B,C,D,E, or F depending primarily on the weather conditions of windspeed and cloud cover. The neutral class, D, should be assumed for overcast conditions during night or day.
3. Determine the height in meters at which the pollutant was released. Use this as the effective height.
4. Determine the distance downwind at which the maximum concentration will occur from attachment #2. To determine the distance:
   a. Locate appropriate stability category curve,
   b. Locate the effective height in meters on the stability curve and
   c. Read the corresponding x_{max} in kilometers on the vertical axis.

The x_{max} is the distance in kilometers from the point of release to the maximum downwind concentration point.

These approximate distances should be used to locate sample stations for collecting routine quarterly downwind samples required in the Appendix A, p. 11 of the license. This method may also be used in the event of an accidental release to establish sampling locations and areas of maximum exposure.

For releases from the main stack and the dust collector, and vacuum cleaner, Tables 1 and 2 in attachment #3 can be used; thus, eliminating steps 3 and 4 of the procedure.

Conversion Factors

1 m/sec = 2.24 mi/hr	or	1 mile/hour = .44 meter/sec
1 m = 3.28 ft.	or	1 ft = 0.305 m
1 km = 3281 ft		1 ft = 3.05×10^{-3} km

Al Valentine

AMV:dg

cc: Don Majors
Wayne Norwood
George Wuller

Any consistent set of units may be used. The most common is:

χ (g m^{-3}) or, for radioactivity (curies m^{-3})
Q (g sec^{-1}) or (curies sec^{-1})
u (m sec^{-1})
σ_y, σ_z, H,x,y, and z (m)

This equation is the same as equation (8.35) p. 293 of Sutton (1953) when σ's are substituted for Sutton's parameters through equations like (8.27) p. 286. For evaluations of the exponentials found in Eq. (3.1) and those that follow, see Appendix 3. χ is a mean over the same time interval as the time interval for which the σ's and u are representative. The values of both σ_y and σ_z are evaluated in terms of the downwind distance, x.

Eq. (3.1) is valid where diffusion in the direction of the plume travel can be neglected, that is, no diffusion in the x direction.

This may be assumed if the release is continuous or if the duration of release is equal to or greater than the travel time (x/u) from the source to the location of interest.

For concentrations calculated at ground level, i.e., z = 0, (see problem 3) the equation simplifies to:

$$\chi(x,y,0,H) = \frac{Q}{\pi \sigma_y \sigma_z u} \exp\left[-\frac{1}{2}\left(\frac{y}{\sigma_y}\right)^2\right] \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right] \quad (3.2)$$

Where the concentration is to be calculated along the centerline of the plume (y = 0), (see problem 2) further simplification results:

$$\chi(x,0,0;H) = \frac{Q}{\pi \sigma_y \sigma_z u} \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right] \quad (3.3)$$

For a ground-level source with no effective plume rise (H = 0), (see problem 1):

$$\chi(x,0,0;0) = \frac{Q}{\pi \sigma_y \sigma_z u} \quad (3.4)$$

EFFECTS OF STABILITY

The values of σ_y and σ_z vary with the turbulent structure of the atmosphere, height above the surface, surface roughness, sampling time over which the concentration is to be estimated, wind speed, and distance from the source. For the parameter values given here, the sampling time is assumed to be about 10 minutes, the height to be the lowest several hundred meters of the atmosphere, and the surface to be relatively open country. The turbulent structure of the atmosphere and wind speed are considered in the stability classes presented, and the effect of distance from the source is considered in the graphs determining the parameter values. Values for σ_y and σ_z are estimated from the stability of the atmosphere, which is in turn estimated from the wind speed at a height of about 10 meters and, during the day, the incoming solar radiation or, during the night, the cloud cover (Pasquill, 1961). Stability categories (in six classes) are given in Table 3-1. Class A is the most unstable, class F the most stable class considered here. Night refers to the period from 1 hour before sunset to 1 hour after sunrise. Note that the neutral class, D, can be assumed for overcast conditions during day or night, regardless of wind speed.

Table 3-1 KEY TO STABILITY CATEGORIES

Surface Wind Speed (at 10 m), m sec^{-1} @ ~40ft	Day: Incoming Solar Radiation			Night	
	Strong	Moderate	Slight	Thinly Overcast or ≥4/8 Low Cloud	≤3/8 Cloud
MPH < 2 (4.5)	A	A-B	B		
4.5-6.7 2-3	A-B	B	C	E	F
6.7-11.2 3-5	B	B-C	C	D	E
11.2-13.4 5-6	C	C-D	D	D	D
13.4> 6	C	D	D	D	D

The neutral class, D, should be assumed for overcast conditions during day or night.

"Strong" incoming solar radiation corresponds to a solar altitude greater than 60° with clear skies; "slight" insolation corresponds to a solar altitude from 15° to 35° with clear skies. Table 170, Solar Altitude and Azimuth, in the Smithsonian Meteorological Tables (List, 1951) can be used in determining the solar altitude. Cloudiness will decrease incoming solar radiation and should be considered along with solar altitude in determining solar radiation. Incoming radiation that would be strong with clear skies can be expected to be reduced to moderate with broken (5/8 to 7/8 cloud cover) middle clouds and to slight with broken low clouds. An objective system of classifying stability from hourly meteorological observations based on the above method has been suggested (Turner, 1961).

These methods will give representative indications of stability over open country or rural areas, but are less reliable for urban areas. This difference is due primarily to the influence of the city's larger surface roughness and heat island effects upon the stability regime over urban areas. The greatest difference occurs on calm clear nights; on such nights conditions over rural areas are very stable, but over urban areas they are slightly unstable or near neutral to a height several times the average building height, with a stable layer above (Duckworth and Sandberg, 1954; DeMarrais, 1961).

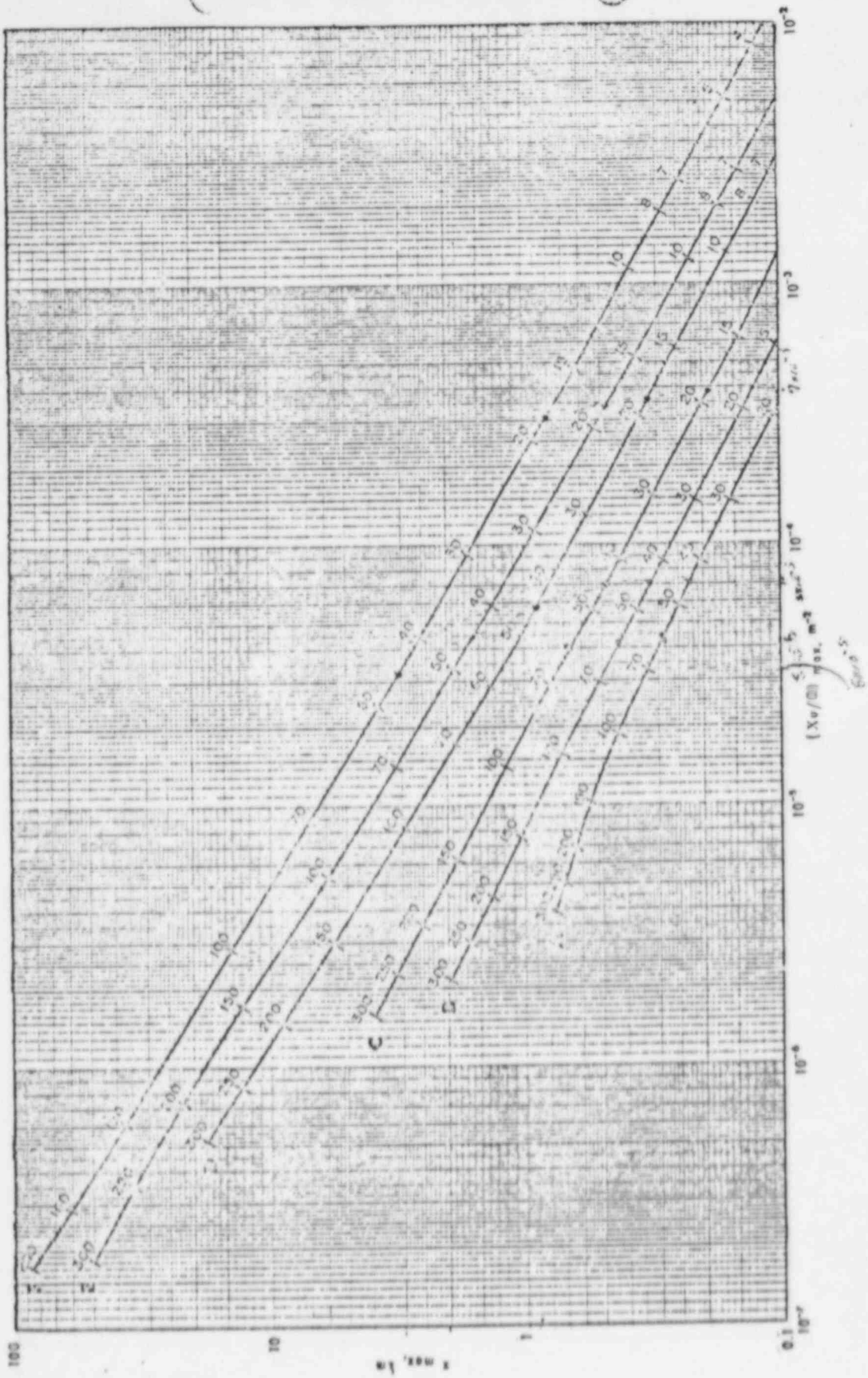

Figure 3-9. Distance of maximum concentration and maximum xu/Q as a function of stability (curves) and effective height (meters) of emission (numbers).

Attachment III

TABLE 2

Distances to Maximum Concentration
for Releases from the Main Plant Stack*

Stability Category	Distance Downwind to Max. Conc. km	feet
A	0.28	890
B	0.34	1080
C	0.48	1520
D	0.9	2850
E	1.6	5080
F	3.2	10200

*Effective height of 150 feet used.

TABLE 3

Distances to Maximum Concentration
for Releases from the Dust Collector and Vacuum Systems*

Stability Category	Distance Downwind to Max. Conc. km	feet
A	0.12	370
B	0.16	500
C	0.23	730
D	0.40	1270
E	0.60	1910
F	1.1	3160

*Effective height of 70 feet used.

HEIGHTS

MAIN PLANT VAC. SYSTEM EXHAUST - 63' } ABOVE GROUND LEVEL 19.25
SAMPLING PLANT DUST COLL. EXHAUST - 62' } 18.95
MAIN PLANT STACK 147.6' 45.1

HAZARDOUS WORK PERMIT KM-2166-A

Nº 18377

LOCATION	BUILDING	FLOOR	SYSTEM	OTHER
EQUIPMENT				
EQUIPMENT IS PREPARED FOR THE FOLLOWING WORK				
ISSUED TO	GROUP		TITLE OR PERSON	

A HAZARDOUS CONDITION EXISTS DUE TO THE PRESENCE OF

INDUSTRIAL SAFETY (ITEMS TO CONSIDER ON BACK OF SHEET)

PROTECTION APPLIED AND LOCATION

NO. OF STOP TAGS PLACED	TIME	DATE	BY (SIG)
PERMIT ISSUED BY (SIG)	TIME	DATE	LOGGED BY

It is the responsibility of the Maintenance Supervisor to see that the following precautions are taken by persons doing the work.

COMPLETED BY HEALTH & SAFETY

- ☐ Respiratory Protection — ☐ Supplied Air — ☐ Full Face Respirator — ☐ Half Mask Respirator — ☐ When Opening System — ☐ During Entire Job
- ☐ Gas Measurements — ☐ Explosive Gas DESCRIBE — ☐ Toxic Gas DESCRIBE — ☐ Oxygen Deficiency
- ☐ Protective Equipment — ☐ Goggles — ☐ Face Shield — ☐ Gloves — ☐ Safety Belt — ☐ Acid Clothing — ☐ Gray-Lite Suit
- ☐ Other Protective Equipment Required
- ☐ Special Ventilation Required — ☐ Special Air Tests
- ☐ Buddy System — ☐ Vessel Entry Procedure — ☐ Other
- ☐ Special Fire Protection Required
- ☐ Special Precaution Required

PERMIT APPROVAL (H & S) SIGNATURE	GAS CHECK RELEASE (H & S) SIGNATURE

REMARKS

The Job Will Not Be Released Until The Housekeeping Has Been Completed.

Work Completed and Permit Released	TIME	DATE	GROUP (BY)	TITLE	SIGNATURE
NO STOP TAGS REMOVED			TIME	DATE	BY (SIGNATURE)
PERMIT CLOSED BY (SIGNATURE)			TIME	DATE	LOGGED BY

DISTRIBUTION White - Maintenance Supervisor
Canary - Shift Supervisor
Blue - Health & Safety

	Sample Location and Identification	Sample Volume	Frequency Collected	Frequency Analyzed	Total No. per Year	Analysis
Air			continously			
211	Northeast - 2000'		~~4 hrs/day~~	Weekly	52	Gross α-β)
212	South - 2000'		" "	"	52	" " (PS&M Dept.
213	~~West~~ North - 1500'		" "	"	52	" ")
Water (Surface)						
221	Illinois River Upstream	2 ℓ	Weekly	Monthly	12	Gross α-β, U, NO_3^-, F^-, Ra-226, (quarterly)
222	" " Downstream - 100yd.	"	"	"	12	" " " " " " "
223	Arkansas River Upstream	"	"	"	12	" " " " " " "
224	" " Downstream I-40	"	"	"	12	" " " " " " "
[illegible]	Pond East	"	Monthly	"	12	" " " " " " "
[illegible]	Pond South	"	"	"	12	" " " " " " "
227	Plant Effluent Stream	"	3 Times daily	"	12	" " " " " " "
Water (well)			weekly	monthly		
231	Seepage, Basin #1 N	2 ℓ	~~Monthly~~	~~Quarterly~~	4	Gross α-β, U, Ra-226, NO_3^-, F^-
232	" , " " S	"	"	"	4	" " " " " "
233	" , " #3 N	"	"	"	4	" " " " " "
234	" , " " W	"	"	"	4	" " " " " "
235	" , " " S	"	"	"	4	" " " " " "
236	" , " " SE	"	"	"	4	" " " " " "
237	Fault Well E	"	"	"	4	" " " " " "
238	Residence NE	"	"	"	4	" " " " " "
[illegible]	Cattle Shed	"	"	"	4	" " " " " "
Soil						
241	South Security Fence	1000g	Quarterly	Quarterly	4	U, F^-
[illegible]	North " "	"	"	"	4	" "
[illegible]	South 1000'	"	"	"	4	" "
244	West "	"	"	"	4	" "
245	North "	"	"	"	4	" "
246	East "	"	"	"	4	" "
Vegetation						
251	South Security Fence		Annual	Annual	1	U, F^-
252	North " "		"	"	1	" "
253	South 1000'		"	"	1	" "
254	West "		"	"	1	" "
256	North "		"	"	1	" "
257	East "		"	"	1	" "